

# COMPREHENSIVE BRIDGE REPLACEMENT AND IMPROVEMENT PLAN for CAPE MAY COUNTY AND BRIDGE COMMISSION BRIDGES



*PREPARED BY:*

*Cape May County Department of Engineering and the Cape May County Bridge Commission*

***MARCH 2023***

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## PLAN REVISION DATES:

Original Plan August 2020

Revision 1 January 2021:

### County Bridges

1. 96<sup>th</sup> Street project description
2. Mill Creek and Upper Thorofare Phase 2
3. 25<sup>th</sup> Street over Avalon canal project description and timeline
4. 21<sup>st</sup> Street over Avalon canal project description and timeline

### Commission Bridges

1. Middle Thorofare bridge introduction and replacement project timeline. Project descriptions timelines for projects A, B, C and E.
2. Townsends Inlet Bridge introduction and replacement project timeline. Project descriptions for projects A, C, D and F
3. Grassy Sound Bridge introduction and replacement project timeline. Project descriptions for projects A, B, C, E, F, G
4. Corsons Inlet Bridge introduction and replacement project timeline. Project descriptions for projects A, B, C, E
5. Ocean City-Longport Bridge project descriptions timelines for project A

Table B Summary of Bridge Replacement and Improvements including Projected Cost Range  
Commission Bridges.

Revision 2 January 2022:

Revision 3 Update 10/10/22

Revision 4 Update 3/10/23

### County Bridges

1. 96<sup>th</sup> Street project description
2. 21<sup>st</sup> Street project description
3. 25<sup>th</sup> Street project description
4. Carnival Bay project description
5. CR 619 over Great Channel project description.

### Commission Bridges

1. Middle Thorofare bridge introduction and replacement project timeline. Project descriptions timelines for projects A, B, C and E.
2. Townsends Inlet Bridge introduction and replacement project timeline. Project descriptions for projects A, C, D and F
3. Grassy Sound Bridge introduction and replacement project timeline. Project descriptions for projects A, B, C, E, F, G
4. Corsons Inlet Bridge introduction and replacement project timeline. Project descriptions for projects A, B, C, E
5. Ocean City-Longport Bridge project descriptions timelines for project A

Table B Summary of Bridge Replacement and Improvements including Projected Cost Range  
Commission Bridges.



## CAPE MAY COUNTY AND CAPE MAY COUNTY BRIDGE COMMISSION BRIDGE LOCATIONS

## CAPE MAY COUNTY BRIDGES

Number	Bridge Name	Municipality	Year Built
0500-001	Ingrams Thorofare	Middle Township	1967
0500-003	Gravens Thorofare	Avalon and Middle Township	1967
0500-004	Roosevelt Boulevard over Crook Horn Creek	Ocean City and Upper Township	1962
0500-005	Ludlams Thorofare	Dennis Township and Sea Isle City	1963
0500-006	96th Street	Middle Township and Stone Harbor	1930
0500-007	Lafayette Street over Cape Island Creek	Cape May and Lower Township	1927
0500-008	Avalon Canal	Avalon	1967
0500-009	Leonards Thorofare	Middle Township	1967
0500-010	21st Street	Avalon	1990
0500-011	Glenwood Avenue	Wildwood and West Wildwood	1990
0500-016	Russ Chattin over Middle Thorofare	Ocean City and Upper Township	1990
0500-017	Scotch Bonnet	Middle Township	1998
0500-018	Cedar Swamp Creek	Upper Township	1967
0500-023	104th Street	Stone Harbor	1987
0500-024	25th Street	Avalon	1987
0500-025	Court House-South Dennis Rd over Sluice Creek	Dennis and Middle Townships	1977
0500-026	Tyler Road over Sluice Creek	Upper Township	1997
0500-027	Elmira Street over Cape Island Creek	Cape May and West Cape May	1985
0500-028	Great Channel	Middle Township and Stone Harbor	1939
0500-029	Upper Thorofare	Lower Township	1939
0500-030	Mill Creek	Lower Township	1939
0500-031	Hand Avenue over Skeeter Creek	Middle Township	1982
0500-032	17th Street over Venetian-Carnival Bayou	Ocean City	2019

## COMMISSION BRIDGES

Number	Bridge Name	Municipality	Year Built
3100-001	Ocean City - Longport	Ocean City and Egg Harbor Township	2002
3100-002	Corsons Inlet	Upper Township	1949
3100-003	Townsend's Inlet	Avalon and Sea Isle City	1940
3100-005	Grassy Sound	Middle Township	1940
3100-006	Middle Thorofare	Lower Township	1940

## GLOSSARY OF TERMS

### ABBREVIATIONS

*County* – County of Cape May

*Commission* – Cape May County Bridge Commission

*ICW* – Intracoastal Waterway

*LBFN* – Local Bridges Future Needs

*NBIS* – National Bridge Inspection Standards

*NJDEP* – New Jersey Department of Environmental Protection

*NJDOT* – New Jersey Department of Transportation

*RFP* -Request for Proposals

*SHPO* -New Jersey State Historic Preservation Office

*SJTPO* - South Jersey Transportation Planning Organization

### BRIDGE TERMS

*Abutment* – retaining wall that supporting the ends of a bridge

*Bascule Span* – moveable bridge with a counterweight that continuously balances a span, or "leaf"

*Bent* – combination of the pier and the cap

*Cap*- structural member which spans across the piles

*Caisson* – box-like structure used as a foundation

*Decking* – roadway portion of a bridge

*Delamination*- subsurface fracture planes

*Efflorescence* – migration of salt to surface of a porous substance

*Fascia* – exposed outermost girder

*Fender* -protects the columns and bridge structure from boats in the navigational channel

*Fixed Span* – bridge with no moveable spans

*Functionally Obsolete* - design no longer meets current geometric design standards

*Girder* - A beam or compound structure acting as a beam



*In-line Replacement* - replacement within the existing footprint of the bridge

*Jacket* – concrete placed around the bridge pile

*Load Posted* – maximum tonnage of a specific vehicle type when analysis indicates that the bridge cannot carry the legal load without overstress

*Off-line Replacement* – replacement outside the existing footprint of the bridge

*Pier* – structural support extending width of bridge to support the spans

*Pile* – long column driven into the ground to form part of a foundation or substructure

*Programmable Logic Controller (PLC)*– computer that accepts inputs and outputs used to control movable span

*Scour* – removal of sand and sediment from moving water

*Spall* - breakaway of concrete resulting from water infiltration or other causes

*Stringer* - longitudinal member of a bridge supporting the deck

*Substructure* – component of bridge that support the superstructure, including piers, footings and piles

*Superstructure* – components of the span including decking, sidewalks, railings and structural members

*TL-1 rating*- crash test level of vehicle traveling 31 mph

*TL-4 rating* – crash test level of vehicle traveling 62 mph

*Trunnion bearing* – a form of short axle attached to the side of a body for rotation

*Waler* - plank of wood, block of concrete, etc., used for support; also, horizontal member in bridge fender system

#### DEFINITION OF NBIS RATINGS and TERMS:

*Excellent Condition*

*Very Good Condition*- No problems noted

*Good Condition* – some minor problems

*Satisfactory*- structural elements show minor deterioration

*Fair Condition*- all primary structural elements are sound but may have minor section loss, cracking, spalling or scour

*Poor Condition*- advanced section loss, deterioration, spalling or scour present

*Serious Condition*- loss of section, deterioration, spalling or scour

*Critical Condition*- advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present. Unless closely monitored it may be necessary to close the bridge until corrective action is taken

*Imminent Failure Condition* - major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic, but corrective action may put back in light service.

*Failed condition*- out of service, beyond corrective action

*Priority Repair Emergency* – Major defects in the structure which, if not repaired immediately, may require closing the bridge or a portion thereof and could lead to a total collapse of the structure resulting from component instability and/or localized element failure or failure to control errant vehicles on the bridge deck. All major defects affecting the structural integrity of the bridge are also included in this category.

*Priority Repair 1* – Advance deficiency on a primary bridge element or appurtenance that may eventually lead to further deterioration, load restriction, lane and/or bridge closure, or may compromise public safety if not corrected. All repairs must be completed within 90 days from notification.

*Priority Repair 2* – A defect in the superstructure, substructure, or deck which, if not repaired within the next 12 months may lead to Priority 1 defects.

## PLAN SUMMARY

The County of Cape May (County) Engineering Department in collaboration with the Cape May County Bridge Commission (Commission) identified the need to prepare and formalize a Bridge Replacement and Improvement Plan. This plan has and continues to address aging bridge infrastructure by providing operational safety serving residents and visitors.

This plan encompasses twenty-three (23) County owned and operated bridges, as well as five (5) bridges owned and operated by the Commission. The primary emphasis over the next fifteen (15) years is to address critical infrastructure needs by replacing the bridges that have surpassed their serviceable life while improving and maintaining the safety and integrity of the remaining bridges.

With tourism as its primary industry, Cape May County draws nearly 10 million visitors annually to its beaches and boardwalks, fishing grounds, golf courses, historical and cultural sites, wineries and breweries, and special events. In 2019, Cape May County's tourism industry generated \$6.6 billion annually and over twenty-six thousand (26,000) jobs. The economy of Cape May County is highly dependent upon its infrastructure, especially its bridges. The continued safe efficient mobility of residents, visitors, commercial vehicles and vessels is a key foundation for this document. In addition to vehicular travel, bicycle and pedestrian accommodations will also be given careful consideration throughout the planning and design processes. The County's vision for itself will be incorporated into new construction and improvement projects to the maximum extent possible and/or practicable.

The bridges must also provide safe passage for marine traffic. Cape May County is home to the Port of Cape May/Wildwood, the largest commercial fishing port in the State of New Jersey. It is one of the top twenty-five (25) ports in the country. The port includes major infrastructure for fish processing, freezing and distribution in New Jersey. The dependable conveyance of marine vessels, including fishing fleet, recreational, and marine construction vessels, is and remains critical to the economic vitality of Cape May County.

Certain County and Commission bridges are subject to the National Bridge Inspections Standards (NBIS) of the United States Department of Transportation Federal Highway Administration. NBIS regulations apply to all publicly owned highway bridges longer than twenty (20) feet located on public roads. Per the NBIS regulations, bridges are inspected on a biennial basis by certified inspectors under the direction of a licensed professional engineer. The latest cycle NBIS reports document County and Commission bridges and their respective present conditions and deficiencies. The reports also identify maintenance and reconstruction elements on each bridge to address safety and extend the bridge's useful life.

The County has made significant investments in maintaining the safety and integrity of the bridges over their history. However, with a number of bridges over 75 years old, the County must accelerate the planning, design, permitting, and construction to maintain or replace the bridges per the NBIS recommendations. All bridge design elements for replacement projects will be updated to current

design standards. These design elements include standards for lane and shoulder widths, vertical and horizontal alignment, load carrying capacity, pedestrian access, and approach guiderail compliance. Bridge studies will determine the viability of replacing bridges in-line or off-line. There are many factors that will be taken into consideration during each of the bridge studies, including environmental impacts, construction phasing, adjoining property impacts and costs.

The County and Commission bridges are critical components of evacuation routes in the event of flooding and other natural disasters. Many of the bridges are the primary means of connecting the barrier islands within the County. The condition of the bridges has direct economic impact on the microeconomies of Cape May County. Therefore, the County must also implement its strategic improvement plan to perform repairs on the bridges to maintain structural and operational safety until those included can be replaced.

No endeavor of this magnitude can be accomplished without solid financial planning that responsibly considers its impact on County taxpayers. While both State and Federal grant sources contribute meaningfully to the costs of implementing this plan (the County is targeting 70% non-County sources), the County is preparing for a more substantial portion, in the range of as much as fifty percent (50%), as the possible obligation of the County. Since the careful development of this plan began over 34 months ago, the Covid-19 pandemic has emerged and disrupted life as well as the National, State, and County economy in a heretofore unseen manner. The level of economic disruption to the County is not yet known and may well have impacts on certain implementation aspects of the plan, at least in the short term. It is important to note that any commitment of funding or bonding as well as the specific allocation of funds in support of this plan will be discussed and authorized on a case-by-case basis thru the action of a Commission Board Resolution.

Fortunately, the County began putting its funding plan in place in 2017 by annually dedicating a portion of its tax levy toward the bridge project. By continuing to do so and by carefully phasing design and construction over a 15-year period, the County will be able to responsibly complete replacements and improvements with modest and manageable effect on County taxpayers. Further detail is provided in the Projected Cost Estimate and Funding section of this document.

Finally, the County acknowledges the impact bridge infrastructure maintains on our county's aesthetic landscape. Each project has an opportunity to apply form with function. Therefore, prospects to integrate placemaking elements in compliance with the County's Creative Placemaking Initiative are evaluated to enhance the aesthetics of each structure in an effort for them to contribute to the surrounding natural and constructed environments. Public access to waterfront recreation, are taken into design consideration for each bridge project. As projects develop, possibilities for assembling aesthetic continuity through use of common bridge elements are explored. This serves to help generate a clearly recognizable identity for the system of infrastructure of County taxpayers' investments in our future.

This plan is updated on a regular interval based upon findings of the NBIS reports and as needed when field conditions arise the necessity.

The following is a detailed summary of proposed bridge replacements and improvements for County and Commission bridges.

#### COUNTY BRIDGES IDENTIFIED FOR MAJOR IMPROVEMENT OR REPLACEMENT

The County owns and operates twenty-three (23) bridges. The County has invested over \$30,600,000 in bridge maintenance and repairs over the last ten (10) years. This includes the re-decking of bridges, substructure repairs, electrical upgrades, and guide rail replacements. The most recent County bridge to be replaced was the 17<sup>th</sup> Street Bridge in Ocean City in January 2019. A portion of this investment has been offset through reimbursements back to the County from the State's Local Bridges Future Needs (LBFN) program. We will continue to pursue this annual funding allotment for all future capital bridge improvements.

The County's bridge inventory consists of several types of bridges including span, movable bascule spans, and culvert type bridges that were constructed between the 1930s and the 1980s. There are four (4) bridges that were constructed between 1930 and 1939 that have reached the end of their service life and are in immediate need of replacement. The NJDOT added twenty-six (26) minor bridges to the county NBIS inventory.

The bridges listed below have reached the end of their service life or will reach the end of their service life within the next 8-13 years. Continued maintenance of the structures is not an option; therefore, the structures must be replaced or undergo substantial rehabilitation as part of the bridge program.

See Appendix A for representative photos of conditions and areas of concern for each bridge.

## 1. 96<sup>th</sup> Street (CR 657) Bridge 0500-006

This bascule span bridge was constructed in 1930. It connects the Township of Middle to the Borough of Stone Harbor. The bridge is registered on the NJ State Historic Register and the National Register of Historic Places per action by the New Jersey State Historic Preservation Office (SHPO) on March 8, 1983. It is New Jersey's only known example of a Rall-type bascule, a rare technologically distinguished movable bridge type. The bascule moves both vertically and horizontally by means of pinions that engage pivoted racks, trunnions nested in rollers, and pinned swing struts.

The 19<sup>th</sup> cycle 2021 NBIS interim report rated the overall physical condition of the structure “serious” due to the superstructure condition. The overall condition is intolerable and requires high priority of corrective action. While still safe for use, the NBIS report recommends this bridge be inspected on a 12-month interval until its replaced.

**Preserving the service life of this structure is the County’s priority until the bridge span can be replaced.**

The approach spans were replaced in the early 1980s and are still functional. The primary issues are related to the bascule span. The machinery and mechanisms to operate the bridge have become obsolete and replacements generally need to be custom fabricated. There are frequent emergency closings of the bridge due to electric, mechanical, and structural issues associated with the bascule span. In 2019 alone, there were three (3) emergency closures of the bridge.

The County has invested over \$2,000,000 over the past ten (10) years upgrading the electrical components and repairing the bascule span. The bascule span is the original construction, and though it was partially rehabilitated during the approach span project, it is at the end of its functional life. The structural members of the bridge have experienced fatigue cracking, and a crack in the main bridge member resulted in the emergency closure of the bridge in October 2016. Similarly, a deteriorated member in the west flanking span resulted in the bridge being closed again in the June 2018. Electrical component failure resulted in the bridge being closed to marine traffic in March 2019. A subsequent structural issue on the southwest bascule discovered on June 21, 2019, resulted in the bridge being closed to marine traffic for over 45 days. A follow-up emergency repair to restore full integrity to the member was performed in June 2020.

Floor beam 3, located at the eastern cantilevered end of the west bascule has experienced cracking, which was temporarily addressed by drilling arresting holes in Spring 2018 and was permanently repaired Spring 2020 by cutting the cracked section of the member out and replacing and strengthening the web. In addition, floor beam 4, which experienced significant loss of section, was strengthened. Several severely deteriorated gusset plates and stringers have been reinforced and strengthened. All rivets with areas of active construction have been replaced with high strength bolts. Repairs have also included shimming loose members and performing electrical upgrades, all to reduce vibrations and restore proper bascule performance by re-balancing the bridge.

The County has also implemented engineering controls to further protect the structure. In Spring 2019 the County installed radar feedback signs, to slow traffic. In Spring 2020 the bridge was load posted to 15 tons, and speed tables installed as a traffic calming measures, all to reduce the vibration of the bascule span.

In 2020, the County performed emergency structural repairs and repainted the main bascule span. The intent addressed emergency repairs providing an enhanced degree of reliability to the components of the bridge to avoid continued unexpected closures until the bascule is replaced. A follow up repair contract is anticipated to address other less deteriorated structural components, rehabilitating the live load shims and anchorages to reduce vibrations. The County has initiated several measures for emergency structural repairs. The work addressed critical deteriorated and distressed structural components.

**This work has provided longevity to the bridge beyond the previous five (5) year life span anticipated if the repairs were not done**

The Programmable Logic Control [PLC] and motor drives were upgraded in 2021 providing reliability and uniformity of the bridge control electronics until a replacement bascule is installed. These upgrades improve bridge operation with modern, readily exchangeable components while eliminating obsolete out-of-fabrication electrical hardware.

Additional emergency repairs to the south ends of floorbeams 3 and 4 and the east approach span through 2020 -2021 were the result of poor initial details on the major structural elements nearing the end of their serviceable life cycle from.

**The County must replace this span as soon as possible.**

The county issued a Request for Proposals and awarded a contract for Consulting Engineering Services in 2021 to design the replacement of the bascule and east approach spans. It is anticipated that it will take five (5) years to design, permit, and construct the bridge. The permitting process will be longer and more complicated than typical bridge projects due to the involvement of the New Jersey State Historic Preservation Office (SHPO), which will need to review and approve the plans for the bridge replacement. The County is proposing to have the replacement span constructed off-site and then installed, which will minimize the time the bridge will be closed to both vehicular and marine traffic. Due to the expense and tolerance of installing a new bascule span, it appears that the existing bascule piers will need to be replaced. As a result, the replacement work will likely take two construction seasons to complete.

Update: in 2021, the County awarded a 3 million dollar design contract to the engineering firm of WSP USA to design the bascule replacement, design a cantilevered walkway along the north facia, replacement and elevating of the east and west approach spans, and electrical, fender and mechanical upgrades. The consultant has prepared concept designs and forwarded the concept to SHPO for concurrence. Predictably SHPO has requested an alternatives report prior to committing on the project. The design concept includes the use of precast coffer box piers, so that the supporting piles

and approach fender systems can be constructed without disturbing the exiting bridge. This will allow construction to proceed more efficiently and reduces the proposed detour to about 1 month. The schedule is still tracking for a fall 2025 bid advertisement with construction proceeding in the late fall. Completion of the bascule project is anticipated for late May 2027. The designers have completed an alternative design review and have concurred that the proposed design is the best alternative and matches the description of the design concept that the county proposed in the design RFP. The County Engineer has been in constant contact with the Infrastructure Bank for partial low interest financing of the project. The I Bank has programmed the project into their system and are very interested in supporting the project financially.

Update 3/23 The County anticipates leveraging our Local Bridges Future Needs Funding FY 2024 and FY 2025 (\$6.0 million) and using available New Jersey I-Bank infrastructure funding for the balance. The design is progressing, and the project is in the permit phase. The USCG provided a favorable response the bascule replacement project and is acting as the lead Federal Agency applying for NJSHPO concurrence on the project. The design team expects that SHPO will provide their finding of fact regarding the replacement of the bascule by late April 2023. The cultural resources study for the project did not recommend any additional archaeological studies. The project is still tracking for a September 2025 commencement of construction.

*Projected Timeline: Project Completion 2025-2027*

*Projected Range of Replacement Construction Cost: \$25,740,000 - \$23,000,000*

*Projected Impacts:* Vehicular traffic is anticipated to be under a full detour for about 4 consecutive weeks during the project. (non tourist season) The design will use a temporary fixed span that will limit marine traffic from September 2026 until the new bascule is operational in May 2027. NJ State Historic Preservation Office review will result in added project costs and possible time extensions to the design of the project. There may be extraneous permit conditions that need to be satisfied due to the historic nature of the span.

**There is no viable option other than to the replace the bascule span.**

See photos [Appendix A pages 1-3](#)



## 2. Mill Creek (CR 621) 0500-030 and Upper Thorofare (CR 621) 0500-029

Formerly owned by the Bridge Commission, these concrete fixed span bridges were constructed in 1939 and are situated along Ocean Drive (CR 621) in Lower Township, west of the Bridge Commission's Middle Thorofare bridge (addressed further in this document). Both bridges are classified as structurally deficient and functionally obsolete due to their width and geometry, scour is present along the abutments and the bridge rails need to be replaced.

Both the Mill Creek and Upper Thorofare bridges serve as a critical link to the fishing industry. They are the only current means by which goods can be transported from the ports since they are not load posted. Their replacement will require substantially less capital investment, regulatory oversight, and construction duration than the Middle Thorofare Bridge.

The 2020 NBIS report for Mill Creek 0500-030 rated the overall physical condition of the structure as "fair" due to the superstructure and substructure conditions. The overall condition is considered somewhat better than minimum adequacy.

The 2020 NBIS Report for Upper Thorofare 0500-029 rated the overall physical condition of the structure as "poor" due to the condition of the substructure. The overall condition meets the minimal tolerable limits. The County anticipates awarding a contract to address the substructure deficiencies for a spring/ fall 2022 construction. When completed, this should upgrade the substructure rating of the bridge.

Both bridges contain geometric challenges due to approach, sight distance and narrow lanes without shoulders.

The County has performed and is proposing intermediate repairs to the structures to extend their service life until the County implements a bridge replacement plan. Due to a limited window of opportunity based upon environmental constraints or potential conflict with work to be done on the Middle Thorofare Bridge, it is proposed that these repairs be phased based upon priority.

**Phase 1** was completed in July 2019. Approach guide rail was installed, the bridge deck and safety walk spalls were repaired, the deck joints were sealed, and the approach roadway transition was paved. Also, the scour under all approach slabs was addressed. Phase 1 cost was \$1,234,997 for both bridges.

**Phase 2** Design is complete, and work is scheduled to begin 2022. Work will address installation of scour countermeasures at the abutments, repair of the underside deck spall, repair of stringer and bridge fascia spalls and pile jacketing.

Update: the County awarded a construction contract to South State in September 2022. A notice to proceed was issued in late September 27, 2022. The substantial completion date for phase 2 is May

1, 2023. The project construction has been ongoing since November of 2022. The pile jacket work is complete, as is the pressure injection of cracked concrete, and the installation of A-Jack abutment slope stabilization. Underdeck spall repairs have been completed at the Mill Creek Bridge, and continue on the Upper Thorofare bridge. Work is on schedule to be completed by May 2, 2023.

*Projected Timeline: October 2022 thru May 2023*

*Projected Range of Cost: \*\$1,3500,000 -\$1,550,0000*

*Projected Impacts: A single lane of vehicular traffic will be needed during a portion of the project using a combination of traffic flaggers and a temporary traffic signal.*

\*The Upper Thorofare Bridge project is being proposed for 2020 LBFN Grant funding at no costs to the County.

**Phase 3** of work will consist of a cantilevered walkway on the south side of the bridge and installation of continuous beam guiderail to replace the existing deteriorated bridge rail. The current bridge rail does not meet a minimum of a TL-1 load condition and was listed in the previous NBIS bridge inspection reports as a Priority 1 required repair. The new rail will be installed in the location of the existing walkway; therefore, the walkway must be constructed to maintain pedestrian access.

*Projected Timeline:* The design plans are at 100% complete and permits are secured. The county expects to submit to the NJDOT for concurrence review in early 2023, it is anticipated that the submission will be delivered to the NJDOT by April 15, 2023. We expect to bid the project in June 2023 for a September 8, 2023 Notice to Proceed. Work should be completed by Memorial Day 2024.

*Projected Range of Cost: \*\$2, 700,000.00*

*Projected Impacts:* Pedestrian access will be closed during the project. A single lane of vehicular traffic will be maintained during the project.

\*This project received a FY 21 LBFN grant in the amount of \$2.26 million dollars for the project.

The three phases of improvements described will provide improved longevity to the bridges and will allow the County to proceed with the eventual bridge replacement as part of the overall Middle Thorofare/Ocean Drive replacement project. These repairs will result in the structures being upgraded from the current structurally deficient classification. In addition, the railing upgrades will result in a TL-4 load capacity rating conforming to required vehicular load impacts and will improve safety while reducing the County's current exposure/ liability. The cost for the replacement of these bridges is included as part of the Middle Thorofare bridge discussed later in this document.

See photos **Appendix A pages 4-7.**



### 3. Hand Avenue (CR 658) 0500-031

This box culvert type bridge was constructed in 1982 and allows Skeeter Island Creek to flow beneath Hand Avenue (CR 658) in Middle Township. The bridge must be replaced due to the undermining of the culverts, erosion of the embankments, sinkholes that have developed on the approaches, and spalling cracking and deterioration of the concrete. Extensive remedial repairs were conducted in December 2017 to minimize soil migration.

The 2020 NBIS report rated the overall physical condition of the structure as “fair” due to the condition of the culvert. The overall condition is somewhat better than minimum adequacy.

Update: The plans are at 95% completion. All environmental permits are secured. All easements and right of way acquisitions have been secured. The consultant is coordinating with Atlantic City Electric to schedule temporary relocation of overhead electric lines that are needed due to the proximity act regarding crane location during construction. The gas main that traverses the culvert has been relocated eliminating the previous gas conflicts. Once provisions for the temporary electric lines are in place, the county will advertise the project. The relocations need to be in place in order to minimize the closure time of the roadway. The county has already allocated bonding for the project as part of a 2021 bridge bond ordinance.

*Projected Timeline:* Advertisement in the summer of 2023 is dependent upon another major county road project, the reconstruction of Goshen Road which is a high priority. Since the detour of the Hand Avenue Culvert Replacement project will be routed along Goshen Road, the Hand Avenue culvert replacement will subordinate to the roadway reconstruction schedule if that project is advancing for a fall 2023 construction. Construction will be completed within 60 days.

*Projected Range of Cost:* \$\*4,530,000 - \$4,730,000

*Projected Impacts:* Hand Avenue will be closed for 60 days, and traffic rerouted during the culvert removal and installation.

\* This estimate also includes the anticipated replacement cost of the proposed Springer’s Mill Road Culvert discussed below.

After the completion of the Hand Avenue Bridge Replacement project, the County will replace Springer’s Mill Road (CR643) over Dias Creek 18’x5’ box culvert and timber wingwalls. The estimated cost to replace this is approximately \$1.9 million. Springers Mill Road will be closed for 60 days, and traffic rerouted during the culvert removal and installation. This structure is currently not part of the County’s NBIS program, however it is anticipated that it will be part of the NBIS program in the future.

See photos Appendix A page 8 and 9.

#### 4. 104<sup>th</sup> Street over Carnival Bay 0500-023

This timber pile and bulkhead bridge was constructed in 1987 and interconnects sections of Stone Harbor along Carnival Bay at 104<sup>th</sup> street. The substructure is entirely made of wood. The tidal zone of the bridge's substructure elements deteriorated from the effects of marine borer activity.

The 2020 NBIS report rated the overall physical condition of the structure as “fair” due to the substructure. The overall condition is somewhat better than minimum adequacy. An increase in heart rot of the waler was observed and section loss due to decay and marine borer activity. In 2014, the County invested \$76,260 in repairs to this bridge. Again in 2021, the County contracted to construct emergency repairs to eliminate active fill loss through defects in the timber sheeting through the tidal zone totaling just over \$50,000. The deck was also resurfaced in 2021.

A replacement study and report, along with a cost estimate, was completed by Urban Engineers over 7 years ago.

*Projected Timeline:* Emergency Deck resurfacing and substructure repairs completed summer 2021. Bridge railing project anticipated completion 2025.

**Update:** On September 13, 2022 a significant sinkhole developed at the westerly abutment (6'x6'x5') approach roadway. The County Engineer immediately declared an emergency and the Commissioners authorized hiring of a contractor to perform repairs to the bridge. A subsequent diver inspection determined that the timber sheeting below the mean low water line has undergone accelerated deterioration due to marine borer attack and is no longer serviceable. The condition of the abutments was the factor that most heavily weighed the need to replace the bridge as part of this bridge plan. The County Engineer determined that under the emergency contract, new abutment sheeting can be installed upland of the existing timber sheeting effectively resulting in new abutments and prolonged life of the overall bridge function. In addition, the existing deteriorated guiderail system will be upgraded with new weldments and the wingwall sheeting will be re-sheeted as needed. Priority piling repairs noted in the August 2022 NBIS inspection report will also be addressed as part of the emergency repair contract. Work is expected to be completed by May, 2023. The project has essentially morphed into a complete bridge reconstruction due to the need to address active deterioration. Both bridge abutments have been replaced with new abutment systems. Deteriorate pilings noted as previous priority 1 and 2 repairs have been jacketed. New sidewalk systems now replace the heaved and settled sidewalk panels. The guiderail system has been replaced and upgraded. When finished, the approach roadway and bridge surface will be resurfaced. This repair will remove this bridge from any 15 years rehabilitation need.

*Projected Construction Cost:* \$800,000.00

*Projected Impacts:* There will be lane closures during the project, but traffic will be maintained. There may be impacts to marine traffic during construction. Sewer and water mains will be temporarily bypassed

*Future Bridge replacement timeline:* Due to the significant amount of repair work, this bridge will be removed from the future replacement list over the next 15 years.

See photos [Appendix A page 10 and 11](#),

## 5. 25<sup>th</sup> Street over Avalon Canal 0050-024

This fixed span concrete bridge on timber piles was constructed in 1987 and interconnects the 25<sup>th</sup> Street portion of Avalon over Avalon Canal.

The 2020 NBIS report rated the overall physical condition of the structure is “fair” due the substructure, based upon the severe deterioration of the timber bulkhead at each abutment generating on. The overall condition is of somewhat better than minimum adequacy.

Active fill loss through severely deteriorated timber sheeting bulkhead walls retaining the bridge abutments. In 2017 the County invested \$219,000 for the design of timber retaining bulkhead repairs to the 21<sup>st</sup> and 25<sup>th</sup> Street bridges. Active fill loss conditions continued and progressed warranting emergency repairs performed in May 2019 due sinkholes. The emergency repairs prompted the need to expedite repair of the substructure and rehabilitation of the timber bulkhead. Additional substructure repairs were performed November 2020

*Projected Timeline:* Abutment rehabilitation: Update : The project was advertised in August 2022 and will be awarded to the contractor on October 11, 2022. The contract completion date is late May 19, 2023. Construction started in early December 2022 and has been steadily progressing. The exterior abutment formwork has been set, reinforcement has been installed, and adjacent bulkhead tie ins are complete. The tremie concrete and structural concrete pours will occur thru March 2023 resulting in the stabilization of the soil loss. The remaining miscellaneous work on the project will be completed by late May, 2023.

*Projected Range of Major Repairs Cost:* \$2, 400,000.00

*Projected Impacts:* There may be lane closures at times during the project, but traffic will be maintained. There will be impacts to marine traffic during construction but permissible. In water construction restriction after March 1<sup>st</sup>.

See photos Appendix A page 12 and 13.

## 6. 21st Street over Avalon Canal 0500-010

This fixed span concrete bridge on timber piles was constructed in 1990 and interconnects the 21<sup>st</sup> Street portion of Avalon over Avalon Canal. The 2020 NBIS report rated the overall physical condition of the structure is “satisfactory” due the substructure. The overall condition of the structure meets present minimum criteria.

In 2017, an increase in the loss of fill from behind both the east and west bulkheads was noted. The County invested \$219,000 for the design of active fill loss and substructure repairs to the 21<sup>st</sup> and 25<sup>th</sup> Street bridges. The active fill loss conditions’ severity increased such that emergency repairs were performed in May 2019 due to a sinkhole forming beneath the pavement. Emergency repairs were implemented to substructure again in 2020 & 2021 due to continued active fill loss through the timber sheeting retaining the abutments. This is the sister project to the 25<sup>th</sup> Street bridge project.

The recent emergency repairs prompted the expedition of permanent repairs of the substructure and rehabilitation of the timber bulkhead. Additional substructure repairs were performed in November 2020.

*Projected Timeline: Abutment rehabilitation: Update :* The project was advertised in August 2022 and will be awarded to the contractor on October 11, 2022. The contract completion date is late May 19, 2023. Construction started in early December 2022 and has been steadily progressing. The exterior abutment formwork has been set, reinforcement has been installed, and adjacent bulkhead tie ins are complete. The tremie concrete and structural concrete pours will occur thru March 2023 resulting in the stabilization of the soil loss. The remaining miscellaneous work on the project will be completed by late May, 2023.

*Projected Range of Major Repairs Cost:* \$2, 400,000.00

*Projected Impacts:* There will be lane closures at times during the project, but traffic will be maintained. There will be impacts to marine traffic during construction. but permittable. In water construction restriction after March 1<sup>st</sup>.

See photos [Appendix A page 14 and 15](#)



## 7. Ludlam's Thorofare (CR 625) Bridge 0500-005

This fixed span bridge was constructed in 1963 to realign, replacing the smaller bridge connecting Dennis Township to the City of Sea Isle. The County is proposing to re-deck this bridge as part of an overall re-decking program for the bridges built in the 1960s due to the wear of the decking.

The 2020 NBIS rated the overall physical condition of the structure as satisfactory due to the superstructure and the substructure condition. The overall condition meets minimum tolerable limits. The deck is in "satisfactory" condition due to the moderate wear of the deck with exposed aggregate throughout, numerous concrete patches with fine pattern cracking, small spall, and a few fine cracks with efflorescence at the underside of the deck.

The superstructure is in "satisfactory" condition due to the moderate pitting (arrested) along the girders and floor beams in span 6. The substructure is in satisfactory condition due to large spalls and severe spalling in the concrete stems of Pier 14, 15, 16 and 17. The spall repairs of the superstructure will proceed any deck replacement contract based upon current bridge conditions.

*Projected Timeline:* Consultant to be selected in 2023. Project completion 2025 (Superstructure spall repairs) The county will proceed with a deck replacement and superstructure painting design contract upon completion of the substructure design contract, anticipated consultant selection-summer 2025.

*Projected Range of Re-decking/Re-painting Cost:* \$\*12,350,000-\$13,400,000

*Projected Impacts:* A deck replacement project, when deemed needed, will be a project that will be completed in two (2) years during tourist off seasons. A temporary traffic signal will be used and traffic during construction will be restricted to one lane with alternating traffic over the bridge.

Update: The most recent NBIS reports indicate little change to the deck surface and there have been no priority notices issued relative to the deck condition. There have been priority notices issues due to the spalling of the prestressed girders. As a result, the County will undertake a superstructure repair contract in the near future to address the immediate concerns and has the luxury to program the deck reconstruction further in the future.

\*The County will seek I-Bank loan funding resembling the Ingram's Thorofare re-decking project.

See photos Appendix A page 16 and 17

## 8. Cedar Swamp Bridge (CR 631) 0500-018

This concrete fixed span bridge, constructed in 1968, allows Cedar Swamp to flow beneath Tuckahoe Road (CR 631).

The 2020 NBIS report rated the overall physical condition of the structure as “satisfactory” due the condition of the substructure. The overall condition equals the present minimum criteria. The deck is in “satisfactory” condition due the fine to medium full-length longitudinal cracks and several concrete patches in all spans. The substructure is in satisfactory condition due to the fine pattern cracking with efflorescence along bents caps 1 and 2 and moderate to heavy weathering with a few wide vertical splits in the timber piles along all bents.

In 2017, the County invested \$6968.82 to improve the guide rail attachments.

The County will be repairing the bridge decking and guiderail as part of structural improvements in response to the NBIS report recommendations.

**Projected Timeline:** Update: the condition of the deck is not of emerging concern, however what is of concern is the condition of the steel abutment sheeting, which is deteriorated within the tidal zone and allowing seepage to occur. The engineering department is working on a repair sketch which will be performed as a change order to one of our current bridge construction contracts. This repair will be completed during the winter of 2023. The guiderail transitions were previously evaluated by our consultant who determined that no conforming guiderail configuration could be constructed due to the existing site constraints. We are in the process of having another consultant take an independent look at a remedy. **Although the condition of the deck is not critical, continued deterioration has resulted in an abundance of spalls. The county will solicit proposals from the bridge design pool for a deck resurfacing design contract in the fall of 2023, so that the deck can be replaced before it becomes a costly and critical condition.**

*Projected Range of Structural Improvements Cost:* **(sheeting repair (\$75,000.00))**

*Projected Impacts:* A temporary traffic signal with alternating traffic will be required during the construction duration.

**The County was planning to replace the bridge in 2030, however, this date will likely be pushed out beyond 2030 once the deck is resurfaced pending an overall assessment of the longevity of the bridge components.**

*Projected Timeline:* **consultant selected for deck replacement 2023 Consultant selected for bridge replacement 2027. Project completion 2031 or beyond pending follow up assessment after bridge deck replacement.**

*Projected Range of Replacement Cost:* **\$8,000,000 – 10,000,000.00**

*Projected Impacts:* Lane shifts, reduced lane widths. Construction will be staged to minimize impacts

See photos [Appendix A page 18 and 19](#).

9. Leonards Thorofare (CR 601) 0500-009 and Gravens Thorofare (CR 601) 0500-003

These fixed span bridges were constructed in 1967 as a series of four (4) bridges (Leonards Thorofare, Ingrams Thorofare, Gravens Thorofare and Avalon Canal) along Avalon Boulevard (CR601) connecting Middle Township to the Borough of Avalon. The bridge decking of both bridges is in poor condition with spalls and exposed rebar.

Re-decking of the Ingrams Thorofare Bridge 0500-001 began in November 2019. Repair of the deck spalls on the Leonards Thorofare and Graven Thorofare bridges were added to this contract extending the life of the decking. Scour and undermining repair work of the Gravens' substructure was also completed in Spring 2020. The County will plan to re-deck the Gravens Thorofare and Leonards Thorofare bridges fully in ten (10) years.

The 2020 NBIS report rated the overall physical condition of Leonards Thorofare bridge as "satisfactory" due to the condition of the superstructure and the substructure. The overall condition is equals present minimum criteria. The deck is in "satisfactory" condition due to wide longitudinal cracks, several random spalls and edge spalls in most of the spans. This condition was upgraded as a result of these recent repairs.

The 2020 NBIS report rated the overall physical condition of the Gravens Thorofare bridge as "fair" due to the substructure conditions. The overall condition is somewhat better than the minimum adequacy. The deck was upgraded to "satisfactory" condition due to random and edge spalls being repaired. Wide longitudinal reflective and transverse cracks are still exhibited throughout the deck.

The County is proposing to re-deck the Leonards Thorofare and Gravens Thorofare bridges as one project to address the spalling of both decks since both are along County Route 601.

*Projected Timeline:* Consultants will be selected Fall 2030. Construction proposed 2032

*Projected Range of Re-decking Cost:* \$4,150,000- \$4,350,000

*Projected Impacts:* Construction will occur during one (1) tourist off-season construction period (Labor Day through Memorial Day) and will result in one lane of traffic with a temporary traffic signal.

See photos [Appendix A page 20-23](#).

## 10. Great Channel Bridge (CR 619) 0500-028

This bascule span bridge was constructed in 1939 as part of the Bridge Commission's Federal Public Works Administration project and connects the Borough Stone Harbor to Township of Middle and the City of North Wildwood. There is no toll collected on this bridge. The bridge was transferred from the Bridge Commission to the County in early 1991.

The 2020 NBIS report rates the overall physical condition as poor due to the condition of the superstructure. The overall condition of the structure is intolerable with a high priority of replacement. The structure is also structurally deficient due to the low inventory rating and functionally obsolete due to the narrow deck geometry. The deck is in "satisfactory" condition due to fine to medium transverse cracks, areas of fine map cracking, concrete patches, small shallow spalls and asphalt patches on top of the deck. The superstructure is in "poor" condition due to the steel section losses and severe pitting at some location in the approach spans.

The County has made significant investments to maintain safety and integrity of the bridge.

In 2016 the County invested \$414,000 for repairs to the bridge abutments.

In 2017, the County invested \$652,770 to recoat the bridge railings of Great Channel Bridge.

This bridge needs immediate rehabilitation to the superstructure (stringer webs between spans 8 and 9, intersecting haunches of steel stringers, general steel section loss upgrades). In addition, the fender system needs replacement. These repairs are part of a planned design and repair contract scheduled for 2020 design and construction in 2022. The project has been submitted for 2021 LBFN funding and has been approved for 1.2 million dollars of a 2020 LBFN grant. In addition, it is our understanding that the New Jersey I-Bank will be selecting this project for 2<sup>nd</sup> quarter funding to provide for total project cost financing (design, construction, and inspection).

Update: The county secured an additional \$3.3 million dollars as part of FY 2022 LBFN grant. This added grant money brings the total to \$4.5 million dollars of grant money making the I-Bank loan unnecessary. The project includes priority 1 and 2 repairs to the superstructure elements, replacement of span locks and replacement of the fender system. The repair work has started in November 2022 and is continuing. The contractor has completed all steel repair and most of the contract spall repairs. The fender system has been replaced and is being completed. The county has increased the contract work for steel repairs in order to address those components not considered critical but in need of repair. This includes all previously listed Priority 1 and 2 repairs. The project is tracking for a May 24 completion date.

*Projected Timeline:* Design Contract issued February 2020 .The project was advertised in August 2022 and awarded on September 27, 2022. An official Notice to Proceed was issued on October 7, 2022. The project completion date is May 24, 2023.

*Projected Range of Improvements Cost:* \$4,950,000

*Projected Impacts:* Rehabilitation will be completed as part of this contract using a single lane of alternating traffic controlled by a temporary traffic signal. There are 2 days remaining in which a complete detour of the roadway will be in place.

Replacement is recommended to remove the bridge from the overall condition category. The bridge is approaching the end of its useful life. The replacement is part of the initial Concept Development Study that will begin in 2023 as the result of the count receiving a Bridge planning grant.

*Projected Timeline:* Replacement 2023-2038

*Projected Range of Replacement Cost:* \*\$74,500,000- \$161,900,000

*Projected Impacts:* If the replacement is performed within the existing bridge footprint, access may be unavailable for one summer season. If the bridge is constructed offline, the costs will be significantly higher, although traffic could be maintained throughout, and the project will span multiple years.

\*This estimate reflects in-line replacement of the bridge as a viable option (lower range), as to be determined by the bridge study

See photos Appendix A page 24 and 25.

#### 11. Marshallville Road Bridge (CR 632) 0500-019

This is a single lane pony truss bridge that has been closed to vehicular traffic for over 15 years due to its condition. The bridge is going to be replaced with a pedestrian bridge since the community wished to link adjacent neighborhood but do not want vehicular cut thru traffic from US Route 49 within the historic area. The county entered into a design contract on April 12, 2022 and the design is approximately 30% complete. It is anticipated that construction will begin in the fall of 2023. The consultant is currently securing permits, which are numerous, since the bridge is situated along a Wild and Scenic Corridor. Public information meetings where the project will be presented for input will occur over the winter of 2023. The project has been submitted to SHPO for review and concurrence. It is anticipated that the approval will be granted sometime in May 2023.

## COUNTY BRIDGES NOT IDENTIFIED FOR MAJOR IMPROVEMENT OR REPLACEMENT

The remaining County bridges listed below are in satisfactory overall physical condition. At present, the following bridges do not need major improvements or replacements within the next 10-15 years. Some of the bridges listed below may require painting of its steel members as part of routine future maintenance. Bridges that have had renovations or repairs within the past 10 years are noted below. All County bridges are considered in this annual bridge maintenance plan. Although, maintaining the safety, integrity, and extending the service life of all the County's infrastructure remains paramount. In addition, the County Engineer is looking into initialing the use of non- chloride based de-icing agents for use on the bridges. The use of non-chloride deicing agents will reduce corrosion of steel members and accelerated concrete contamination which will have an overall benefit to preserving the structures and extending their anticipated life.

Update: The county has used a non-chloride based deicing agent (Sodium Formate) during the winter of 2022 with success. The county is continuing with the use of that deicing agent for the winter of 2023 and going forward.

Proactively painting steel members as well as sealing/painting concrete substructure components will be a relatively inexpensive means to economically extend structure life staying off major replacement or rehabilitation projects.

0500-001 Ingrams Thorofare Bridge – In 2017, the County invested \$1,251,956 for underwater structure repairs to the bridge. The County invested \$7.9 Million to re-deck the Ingrams Thorofare bridge. Work began in November 2019 and the eastbound lane re-decking was completed in May 2020. Work began on the westbound lane in November 2020 and the project was completed in June 2021.

0500-004 Roosevelt Boulevard Bridge over Crook Horn Creek - In 2015, the County invested \$7,859,304 to re-deck the Roosevelt Boulevard Bridge. This bridge will undergo a painting contract in the next 5 years.

0500-007 Lafayette Street Bridge over Cape Island Creek - In 2013, the County invested \$214,481 to perform emergency repairs to the tide gate related to Superstorm Sandy. In 2018, the County invested \$1,513, 506 to repair the substructure.

0500-008 Avalon Canal – In 2010, the County invested \$4,472,373 to rehabilitate and widen the bridge.

0500-011 Glenwood Avenue

0500-016 Russ Chattin over Middle Thorofare

0500-017 Scotch Bonnet Bridge – In 2014, the County invested \$6,606 for underwater inspection of the timber pedestrian bridge. The inspection warranted the closing of the pedestrian bridge. The pedestrian bridge will be evaluated for replacement. Since the speed along Stone Harbor Boulevard

has been lowered, the construction of a cantilevered fishing walkway attached to the bridge is now a viable project. The county is evaluating traffic parking accommodations and once addressed we will solicit proposals for the cantilevered fishing pier design.

0500-023 104<sup>th</sup> Street over Carnival Bay - Since this bridge is undergoing a major reconstruction and replacement of main components, its condition will be upgraded and not future work on the bridge will be necessary for the foreseeable future.

0500-025 Court House-South Dennis Road over Sluice Creek

0500-026 Tyler Road over Sluice Creek

0500-027 Elmira Street over Cape Island Creek

0500-032 17<sup>th</sup> Street over Venetian Carnival Bayou – In 2018, the County invested \$70,000 to improve the abutments. In 2017, the County invested \$2,534,589 to replace the bridge. The project was substantially completed in January 2019.

The current twenty-six (26) minor bridges in Cape May County identified as part of the County's initial minor bridge NBIS inspection cycle. Investigations, priority 2 repairs and improvements resulting from the initial cycle have been completed on:

0505CMC – sidewalk and railing bases renewed

0516MID – installed rip rap around pipe orifices, Every fall, silt vacuum removal at both inverts

0522UPP - installed DGA at both bridge approaches

The County does not own a number of minor bridges. However, the County assists and coordinates with bridge owner municipalities. Identifying funding sources for making the necessary repairs.

The County continues assessing accurate physical condition evaluation of all bridge to determine maintenance and repair priorities as the accepted standards necessitate.



## CAPE MAY COUNTY BRIDGE COMMISSION BRIDGES

The Cape May County Bridge Commission currently owns and operates five (5) bridges; one fixed bridge (Ocean City – Longport) and four (4) single leaf bascule bridges (Corsons Inlet, Townsends Inlet, Grassy Sound, and Middle Thorofare) linking the barrier islands via Ocean Drive. The formation of the Bridge Commission in 1934 by the Board of Chosen Freeholders created the Commission to finance, construct, and operate the bridges while permitting the collection of tolls to offset capital, maintenance, and operating expenses.

The Commission's original 1939 construction plans included Great Channel, Mill Creek, and Upper Thorofare Bridges which were deeded over to the County of Cape May in 1991. Three of the five bridges (Townsends, Grassy Sound, Middle Thorofare) opened to traffic in June 1940, the fourth (Corsons) opened to traffic in 1949. The original Ocean City – Longport bridge, constructed in 1926, was acquired by the Commission in 1946, then, replaced in 1999-2002 with the new structure opening to traffic in July 2002. A portion of the original bridge was re-purposed as a fishing pier on the Atlantic County side and lies adjacent to the present-day highway bridge. The four (4) "lower bridges" (Corsons Inlet, Townsends Inlet, Grassy Sound, and Middle Thorofare) are structurally deficient, functionally obsolete, load posted for 15 tons, and all are being programmed for future replacement.

The County has invested over \$39,000,000 over the past 10 years to perform maintenance and repairs on the Commission bridges. These repairs have included superstructure, substructure repairs, partial bridge replacements, electrical/mechanical repairs, submarine cable installations, and structure recoating. While all replacement and capital improvement costs are now borne by the County, the Commission will continue to collect toll revenue to finance administration, bascule operations, inspections, and a portion of maintenance for which its revenue is sufficient.

See Appendix A for representative photos of conditions and areas of concern for each bridge.

## 1. Middle Thorofare Bridge (CR621) 3100-006

This bascule span bridge was constructed in 1939 and is part of a series of bridges that connects Wildwood Crest to Lower Township and the southern terminus of the Garden State Parkway. This bridge is beyond its service life and must be replaced. Safeguards related to bridge openings were installed in 2017 and 2018, while an emergency scour protection repair was completed after Hurricane Sandy (October 2012). Miscellaneous substructure and super structure repairs were completed from the 1970s through the 1990s.

While still safe for travel, the 2019 NBIS Inspection Report rated the overall condition of the structure as “critical” due to the low inventory ratings. The deck rating is “satisfactory” due to medium and wide transverse cracks, several spalls, and areas of exposed rebar. The superstructure condition rating is “poor” due to the painted over section loss, pitting holes, and collision damage in the steel girders. The substructure condition rating is “poor” due to the heavy collision damage, missing portions of the fender system, and undermining at Pier 8 and Pier 13. In 2021 a 7.5-million-dollar contract was completed which replaced the bridge railing system, approach guiderails, fender system, and steel repairs to the bascule span. Also, in 2021 the existing toll booth was retrofitted with new windows, roofing, electrical and bridge control wiring, AC and heating system, new interior insulation and wall coverings, and completely painted.

This bridge is part of the Ocean Drive (CR621) Improvements and Bridge Replacement Project and is at the end of Local Concept Development Phase with the final report submitted to NJDOT in December 2020 and awaiting their approval. The South Jersey Transportation Planning Organization (SJTPO) has been working with the County to secure supplemental State and Federal funding sources for the construction portion of the project. The Bridge Commission, the public, and the County Freeholder Board were presented eight (8) alternatives during several public meetings, and a preferred alignment for the proposed fixed-span replacement was advanced in Spring 2019. The preliminary preferred alternative (PPA) minimizes environmental impacts as well as impacts to local businesses, while maintaining traffic flow during the replacement process. Value engineering was submitted to the NJDOT in December 2020. Once NJDOT concurs, the County can proceed with preliminary design. Because this bridge has been identified as the first priority for replacement, rehabilitation projects will be limited to what is necessary to maintain structural integrity and safety elements until scheduled replacement construction is commenced in 2023.

Ocean Drive (CR621) Roadway Improvements and Bridge Replacements: Middle Thorofare (3100-006), Mill Creek (0500-030), Upper Thorofare (0500-029)

### Update:

**Projected Timeline:** Local Concept Development plan was approved February 2021 by FHWA & NJDOT. The engineering department issued an RFQ for the preliminary engineering phase in February 2022, however, the Purchasing Department withdrew bids so that the document could be first vetted by the State Comptroller. Concurrent with that review, the county had

been advised by both the NJDOT and NJDEP Commissioner that new climate change regulations would be enacted that would significantly impact the preliminary design of the project, and that the county should only advance preliminary design to a point not impacted by the proposed regulations. After repeatably requesting clarifications on the impact of any proposed rule changes on the viability of the project's PPA3, we have now been advised that the department is lessening the requirements of their previously contemplated rule changes and that any proposed changes should not longer have a drastic impact on the design of the project. The proposed rule changes will not be in effect for at least 18 months and we have requested written confirmation from the NJDEP that the originally contemplated rule changes have now been superseded by much less substantive proposed rule changes that closely parallel current regulations for public developments. Although the Department has been reluctant to issue a project specific memorandum, subsequent meetings with the Assistant Commissioner have resulted in an assurance that the project would not have to conform to additional restrictions imposed by the proposed climate change regulations. The County Engineer's office has completed the final draft of the RFP document that will be circulated to the Administration in late March for review and final comment. It will then advance back to the State Comptroller for final Concurrence. We anticipate the RFP being advertised in the late spring of 2023 with a Bridge consultant selected by the fall of 2023. Preliminary & final Design phases 2023-2027. Construction 2028-2030. See County section for phased construction description.

*Projected Range of Replacement Cost:* \$238,000,000 to \$243,000,000

*Projected Impacts:* There are multiple factors in the replacement of the bridge. The northern approach lanes are located adjacent to environmentally sensitive areas under the jurisdiction of US Fish and Wildlife as part of the Cape May National Wildlife Refuge. Additionally, there are multiple businesses along the proposed central location of the bridge. The County understands the importance of minimizing impacts to business. The proposed Middle Thorofare Bridge will be built "off-line" out of the current alignment to maintain existing traffic flow. Marine traffic will be maintained, however, impacts during in-water construction will require coordination and management. See County Bridge section for Mill Creek & Upper Thorofare projected impacts.

## Middle Thorofare Bridge Improvements

To maintain Middle Thorofare Bridge until replacement, the Commission plans to perform capital improvements that are recommended in the NBIS Inspection reports.

- A. Substructure Rehabilitation (scour countermeasures south abutment and pier 13): This project addresses local soil scour at base of Pier 13 caisson type foundation which exposed the existing H pilings within the caisson. In addition, the erosion of the fill material within the south bin abutment will be addressed similar to the north abutment and at Corsons Inlet bridge. This project is being combined with Grassy Sound north bin abutment erosion.

*Projected Timeline:* Design and construction 2022-2024

*Projected range of Costs:* \$1,170,000 to \$1,470,000

*Projected Impacts:* Work is outside the main navigation channel so marine traffic impacts should be minimal. Minimal or no vehicular impacts are expected as the project can be constructed from the waterway. Environmental impacts of water turbidity during repairs will impose work schedule restrictions.

- B. Electrical Rehabilitation Projects: The existing motor, drive controls, and Programmable Logic Controller (PLC) system are obsolete with parts unavailable for the drive controls and PLC systems. The existing motor windings are degraded and in need of a rewinding or replacement. There is no auxiliary drive system for the bascule span, therefore failure of one of these systems will render the bascule span nonfunctional severely impacting the local fishing fleet and processing plants. The existing emergency generator housing is severely deteriorated and the generator itself is significantly aged and in need of replacement. This project will restore safe and reliable bascule operations allowing the 5000- 6000 annual bridge openings to continue until the bridge is replaced. Includes replacement of the main motor, drive controls, PLC, emergency generator and installation of auxiliary motor, span locks, and safety gate replacement. The drive controls and PLC replacement parts have been ordered and scheduled for replacement prior to the **spring of 2023**. Project scope and timeline may be adjusted depending on the bridge replacement program schedule.

*Projected Timeline:* Design and construction 2022-**2024**

*Projected range of Costs:* \$540,000 to \$840,000

*Projected Impacts:* Bascule operations will be impacted in discrete blocks of time while new equipment is switched over to operations. Coordination with local fishing fleet will be critical.

- C. Super Structure Recoating: This project will address only the most severe coating failure areas and minimal structural steel repairs. Project scope and timeline may be adjusted depending on the bridge replacement program schedule.

*Projected Timeline:* Design **2023-2024. Construction 2024-2025**

*Projected range of Costs:* \$475,000 to \$775,000

*Projected Impacts:* The work will be performed using single lane alternating traffic permitting traffic flow during all phases of construction. Minimal impacts to bascule operations and fishing fleet.

- D. Control House Rehabilitation: The existing control house interior and exterior building components are from the original 1940 construction. Project will make the buildings weathertight, upgrade electrical components, and improve toll collector work environment.

*Projected Timeline:* Design and construction 2023.

*Projected range of Costs:* \$105,000-\$125,000

*Projected Impacts:* The work will be performed utilizing the existing single lane alternating traffic pattern setup by the railing replacement contractor. Minimal impacts to bascule operations and fishing fleet. Possible impacts to traffic.

See photos Appendix A pages 26-27.



## 2. Townsends Inlet Bridge (CR 619) 3100-003

This bascule span bridge was constructed in 1939 and connects Sea Isle City to the Borough of Avalon along Ocean Drive. This bridge has been rehabilitated several times in the past 10-15 years, and most recently Spans 1-7 were replaced in their entirety in July 2019. The installation of emergency temporary supports for pier 6 occurred in 2017, the bridge railings were replaced 2018-2019 and submarine cable was replaced in 2019. The bascule span and toll span were rehabilitated in 2014-2015 along with substantial machinery rehabilitation and PLC replacement. In 2011, the entire bridge was repainted and in 2009 structural repairs performed to the superstructure. South fender system was replaced in 2010. Recently completed in 2021 was the installation of a new motor drive control system allowing more reliable bascule span operations. Also completed in 2021 was Priority Repairs to the east bascule trunnion column and SW warning gate support.

The 2019 NBIS report rates the overall condition of the structure as “poor” due to the superstructure, and low inventory ratings. The deck condition rating is “satisfactory” due to medium and wide transverse cracks and several spall on the top, facias and underside surfaces. The superstructure condition rating is “poor” due to painted over section loss, pitting and holes in the girders, steel beams and stringers, and bearing elements. The substructure’s physical condition rating is “fair” due to heavy collision damage and missing portions of the fender systems at piers 7 and 8 from the south. As well as the severe section loss of the steel caisson shells and severe laminar corrosion. The substructure condition rating was raised from “poor” to “fair” with replacement of old spans 1-7 in 2019.

### Townsends Inlet Bridge Replacement

A cursory bridge replacement study was authorized by the County in 2017 and presented to the Commission in October 2017 in response to the failure of the deteriorated substructure elements and several bridge closures due to repairs. The recommended alternative by the consultant was a parallel structure built offline with a single leaf bascule main span. The study provided a brief overview of replacements options, potential environmental constraints, and preliminary costs. In order to replace the bridge a formal Local Concept Development Study will be first developed to gain project input from public officials, stakeholders, and the general public. Alternatives will be conceptualized and developed which advance the purpose and need of the project.

In July 2022, the Commission in conjunction with the County, applied for a planning grant for a Comprehensive Bridge Planning Project through the Bridge Investment program. The Commission was successful in securing a grant in the amount of \$1.9 million dollars. This concept development study included the **Townsends Inlet Bridge (Commission), Great Channel Bridge (County), Grassy Sound Bridge (Commission) and the Corson’s Inlet Bridge (Commission)**. The county is currently awaiting authorization of the Federal Agreement in order to proceed with the project. The study will determine the Preliminary Preferred Alternative for replacements of each of the bridges.

The project will proceed as two individual studies, grouping the Great Channel and Grassy Sound bridges as one study and the Townsends Inlet and Corson Inlet bridges as the other study.

*Projected Timeline:* Concept Development 2023-2024. Preliminary engineering and final Design 2025-2028. Construction 2028-2030. Timeline is dependent upon funding.

*Projected Range of Replacement Cost:* \*\$65,750,000 to \$167,750,000

*Projected Impacts:* The replacement bridge may likely be built off-line to maintain existing traffic flow. If an in-line replacement plan is selected, annual shutdowns between September through May will be necessary. There are environmentally sensitive areas on both approaches of the bridge, which will extend the permitting process and possibly affect proposed alignment of a new bridge. Marine traffic will be impacted if a channel relocation plan is selected.

\*This estimate reflects the in-line replacement of the bridge as a viable option which will be part of the Local Concept Development study.

In addition to replacing the bridge in its entirety as recommended in the NBIS, the Commission and County will evaluate replacing the bridge in-kind. The replacement may require modifications to the recently constructed Spans 1-7. This option would provide a cost benefit by reducing construction costs and taking advantage of the recently constructed spans by incorporating them in the new bridge if feasible. This cost is reflected in the project range of replacement cost.

#### Townsends Inlet Bridge Improvements

To maintain Townsends Inlet Bridge until replacement, the Commission plans to perform improvements that are recommended in the NBIS Inspection reports. The Replacement of Spans 1-7 completed in July 2019 addressed the scour concerns at Piers 1 through Pier 6 presented in the NBIS report. Because the bridge is being programmed for replacement, the remaining piers are being monitored with underwater inspections at 24-month intervals and interim seabed elevation checks after significant storm events. The Commission will be performing the following repairs and improvements until the bridge is replaced:

- A. Fender Replacement This project consists of reconstruction of the damaged fender components from several vessel allisions. These defects were upgraded to a Priority 1 repair in the last cycle NBIS report. Fender replacements are being combined using a prototype design concept to address similar repairs at Ocean City Longport, Corson's Inlet, and Grassy Sound Bridges.

*Projected Timeline:* Design 2022-2023. Construction 2024

*Projected range of Costs:* \$1,720,000 to \$1,920,000

*Projected Impacts:* Brief vehicular traffic interferences due to installation of pilings below bascule span. Marine vessel impacts due to contractor occupying channel during construction at periodic times. Environmental impacts due to water turbidity and

proximity to environmentally sensitive areas. Anticipated environmental restrictions limiting construction periods.

- B. Super Structure Recoating: Townsends Inlet Bridge was completely recoated in 2011 under Federal Work Stimulus program using a Transportation Investment Generating Economic Recovery (TIGER) Grant. The steel coatings are degrading, and corrosion is growing at an accelerated rate. The coating system is the structural steel's first line of defense against the harsh marine environment. Repair of the coating system will arrest deterioration and extend the life of the structure until replacement. This project may be combined with the structural steel repairs noted above.

*Projected Timeline:* Design and construction 2023-2024

*Projected range of Costs:* \$1,025,000 to \$1,525,000

*Projected Impacts:* The work will be performed using single lane alternating traffic permitting traffic flow during all phases of construction. Impacts to bascule operations would occur in brief intervals.

- C. Electrical Rehabilitation Projects: The existing power feed to the bridge is supplied by a 4,060 Volt feeder cable hanging beneath the eastern safety walk on the bridge. Three (3) Atlantic City Electric owned transformers are within a concrete vault at the bascule span pier and were replaced in July 2019 after catching fire due to deterioration of the transformer housing. Subsequently the grounding system on the bridge will be upgraded too. This project would relocate the transformers to a utility pole on the Sea Isle side of the bridge and reduce the voltage to a much safer 240 Volts. A similar project was successfully completed at Middle Thorofare Bridge in 2016. A new pad mounted natural gas generator is recommended for installation on the Sea Isle City side at the base of the existing utility pole. This facility relied upon a portable generator which has been removed from service.

*Projected Timeline:* Design and construction 2022-2024

*Projected range of Costs:* \$280,000 to \$380,000

*Projected Impacts:* The work will be performed using single lane alternating traffic permitting traffic flow during all phases of construction. Minimal impacts to bascule operations during power switchover.

See photos Appendix A page 28 and 29.



### 3. Grassy Sound Bridge (CR 619) 3100-005

This bascule span bridge was constructed in 1939 and connects the Borough of Stone Harbor to Middle Township and North Wildwood along Ocean Drive (CR 619). This is the least traveled bridge among the Commission bridges. Based upon the NBIS reports, this bridge requires substantial structural upgrades and major rehabilitation of the bascule span to remain operational. This bridge will eventually need to be replaced once higher priority bridges are replaced. The 2019 NBIS report rates the overall condition of the structure as “serious” due to the superstructure. The deck is in “satisfactory” condition due to medium-wide cracking and incipient large spalls with exposed rusted rebar on the top and underside surfaces, severe delamination and spalls and exposed rebar on the fascia of several spans, and severe section losses and holes on the bridge railings.

The superstructure is in “serious” condition due to severe section losses, and holes in the steel stringers of the bascule pan. There are also paint-arrested pitting losses, and holes in the steel deck girders, stringer and on 3-stringer approach spans. The substructure is in “poor” condition due to the complete loss of fill within and around the perimeter of the abutment vault structure. There is heavy collision damage, severe decay and missing lower wales on the Pier 13 fender system.

In 2021, supplemental steel was added to the bascule span stringers, deck and safety walk patching was performed, railing repairs completed, toll booth curbing repaired, and steel supports added to the southeast gate. Also, new motor drive controls and PLC were installed allowing more reliable bascule span operations.

#### Grassy Sound Bridge Replacement

The replacement process will likely follow Federal Highway Association guidelines to preserve Federal funding capabilities. This process includes a formal Local Concept Development Study to gain project input from public officials, stakeholders, and the general public. Alternatives will be conceptualized and developed which advance the need and purpose of the project.

*Projected Timeline:* Concept Development/ Preliminary Design 2023-2024. Final Design 2025-2028. Construction 2035-2038. Timeline is dependent upon funding.

*Projected Range of Replacement Cost:* \*\$53,500,000 to \$93,500,000

*Projected Impacts:* The replacement will be likely be constructed off-line to maintain existing traffic flow. Navigational impacts for bridge replacement should be coordinated with replacement plans for the County’s Great Channel Bridge to the north as this is an alternate access to the Intracoastal Waterway (ICW). Grassy Sound Replacement Bridge will likely remain a movable bridge based on the existing navigational waterway depths in the area and access to the ICW and Hereford Inlet.

\* This estimate reflects in-line replacement of the bridge as a viable option, which will be part of the Local Concept Development study.

## Grassy Sound Bridge Improvements

To maintain Grassy Sound Bridge until replacement, the Commission plans to perform improvements that are recommended in the NBIS Inspection reports. The Commission will be performing the following repairs until the bridge is replaced:

- A. Fender Reconstruction: This project consists of reconstruction of the damaged fender components from vessel collisions. and is being combined with fender projects from Townsends Inlet, Corsons Inlet, and Ocean City Longport bridges. These defects are identified as a Priority 2 repair in the current and past NBIS reports.

*Projected Timeline:* Design 2022-2023. Construction 2024-2025

*Projected range of Costs:* \$1,850,000 to \$2,250,000

*Projected Impacts:* Brief vehicular traffic interferences due to installation of pilings below bascule span. Marine vessel impacts due to contractor occupying channel during construction at periodic times.

- B. Structural Steel Repairs- Approach Span Strengthening: This project addresses specific steel elements within the bridge's superstructure that are reducing the load ratings. Further reduction in load ratings would require the Commission to Load Post below 15 Tons which would significantly impact local delivery vehicles. Low load ratings and defects are identified as a Priority 2 repairs in the current and past NBIS reports. This project is currently in the design phase.

*Projected Timeline:* Design and construction 2020-2024.

*Projected range of Costs:* \$4,000,000 to \$5,000,000.

*Projected Impacts:* Brief vehicular traffic interferences due to contractor moving materials to the underside of the deck. Marine vessel impacts should be minimal as no work is proposed in the navigation channel. Most structural repairs are hidden from view however SHPO will need to be consulted for any significant visual changes to the structure.

- C. Super Structure Recoating: Grassy Sound Bridge was completely recoated in 2011 under a Federal Work Stimulus program using a Tiger Grant. The steel coatings are degrading, and corrosion is growing at an accelerated rate. The coating system is the structural steel's first line of defense against the harsh marine environment. Repair of the coating system will arrest deterioration and extend the life of the structure until replacement.

*Projected Timeline:* Design and construction 2023-2024

*Projected range of Costs:* \$1,025,000 to \$1,525,000

*Projected Impacts:* The work will be performed using single lane alternating traffic permitting traffic flow during all phases of construction. Impacts to bascule operations would occur in brief, one-to-two-week intervals.

- D. North Bin Abutment Scour Rehabilitation/ Slope Restoration: The north bin abutment is severely scoured and eroded within the vault. This project will refill this area with low strength concrete, seal the abutment, and restore the slope protection. These defects are identified as a Priority 2 repairs in the current and past NBIS reports. This project is being combined with similar repairs required at the Middle Thorofare Bridge.

*Projected Timeline:* Design and Construction 2022-2024

*Projected range of Costs:* \$660,000 to \$960,000

*Projected Impacts:* Work is outside the main navigation channel so marine traffic impacts should be minimal. Minimal or no vehicular impacts are expected as the project can be constructed from the waterway and shoulder areas. If needed single lane alternating traffic control will be used to maintain traffic. Environment impacts due to work in the tidal zone.

- E. Bascule Span Rehabilitation: This project will be similar to the Townsends Inlet Bascule and Toll Span project in 2013-16, however is reduced in scope to only include structural steel work and mechanical/electrical work.

*Projected Timeline:* Design and construction 2024-2026

*Projected range of Costs:* \$5,590,000 to \$6,515,000

*Projected Impacts:* Detours of vehicular traffic will be necessary as well as marine vessel impacts due to the bascule span positioning for construction. Work will be scheduled for the off season to minimize these impacts.

See photos Appendix A pages 30-31.

#### 4. Corson's Inlet (CR 619) 3100-002

This bascule span bridge was constructed in 1949 and connects Ocean City to Strathmere in Upper Township along Ocean Drive (CR 619). This bridge is structurally deficient and functionally obsolete and will eventually need to be replaced. The bascule span has not operated since December 2013 due to deterioration of the bascule trunnion support column. The bridge superstructure was strengthened and repainted in 2007 with bridge railings replaced in 2012. Substructure repairs and scour countermeasures at the north abutment were completed in 2015-16. Because the bascule span has not been operational for the past several years, the infrequency of previous bascule openings, and hazardous navigational conditions of Corson's Inlet, the Commission, with endorsement from the County, will seek to petition the US Coast Guard to close the bascule span permanently. This process is anticipated to take approximately two (2) years from the time the request is made to the Coast Guard. In 2021 underdeck concrete patching was completed in several north approach spans and above deck patching in the toll span area.

The 2019 NBIS report rated the overall condition of the structure as "serious" due to the condition of the substructure. The deck condition rating is "poor" due to the large area of spalls with exposed severely corroded reinforcing on the underside of the deck slab in span 32 from the north. The superstructure condition rating is "poor" due to painted over section loss, pitting and holes in the steel girders and stringers, bearing elements, and sever pack-rust between many steel sliding plate bearings. The pin hanger assemblies appear to be frozen due to corrosion. The substructure rating is "serious" due to the severe section loss of the web and flanges on the steel built-up trunnion bearing column which is supporting the west girder at the trunnion bearing.

#### Corson's Inlet Bridge Replacement

The replacement process will likely follow Federal Highway Association guidelines to preserve Federal funding capabilities. This process includes a formal Local Concept Development Study to gain project input from public officials, stakeholders, and the general public. Alternatives will be conceptualized and developed which advance the need and purpose of the project.

*Projected Timeline:* Concept Development/ Preliminary Design 2023-2024, Final Design 2025-2028, Construction 2032-2035.

*Projected Range of Replacement Cost:* \*\$70,750,000 to \$105,750,000

*Projected Impacts:* The replacement will be likely be constructed off-line to maintain existing vehicular traffic flow. Due to the unpredictable navigation within Corson's Inlet, marine traffic is predominantly smaller vessels which would not be significantly impacted by the bridge replacement. The north approach (Ocean City side) has environmentally sensitive areas which will increase the permitting time and affect structure's alignment choices.

\* This estimate reflects in-line replacement of the bridge as a viable option, which will be part of the Local Concept Development study.

## Corson's Inlet Bridge Improvements

To maintain Corson's Inlet Bridge until replacement, the Commission plans to perform improvements that are recommended in the NBIS Inspection reports. The Commission will be performing the following repairs until the bridge is replaced:

- A. Fender Replacement: This project consists of replacement of the fender system due to deterioration and impacts from vessel allisions and being combined with fender replacement projects at Corsons Inlet, Townsends Inlet, and Grassy Sound bridges. These defects have been upgraded to a Priority 1 repair in the current NBIS report.

*Projected Timeline:* Design 2022-2023. Construction 2024-2025

*Projected range of Costs:* \$2,400,000 to \$2,900,000

*Projected Impacts:* Brief vehicular traffic interferences due to installation of pilings below bascule span. Marine vessel impacts due to contractor occupying channel during construction at periodic times.

- B. Corson's Inlet Bridge Rehabilitation: This project will repair steel support columns of the existing bascule span and address toll girder steel repairs adjacent to these supports. Span 32 deck has one quadrant which the deck will be replaced due to severely corroded exposed reinforcing steel. The defects are identified as Priority 1 repairs in the current and past NBIS reports. This project is currently awaiting NJDOT authorization to advertise for construction.

*Projected Timeline:* 2023-2025

*Projected range of Costs:* \$4,000,000 to \$5,000,000

*Projected Impacts:* The work will be performed using single lane alternating traffic permitting traffic flow during all phases of construction. Potential impacts to marine vessels due to construction equipment within the channel. Permits have been received to complete concrete repairs to one of the bascule pier's caissons.

- C. Super Structure Recoating: Corson's Inlet Bridge was completely recoated in 2007 as part of a structural strengthening program. The steel coatings are degrading, and corrosion is advancing at an accelerated rate. The coating system is the structural steel's first line of defense against the harsh marine environment. Repair of the coating system will arrest deterioration and extend the life of the structure until replacement.

*Projected Timeline:* Design 2023-2024 Construction 2024-2025

*Projected range of Costs:* \$1,025,000 to \$1,525,000

*Projected Impacts:* The work will be performed using single lane alternating traffic permitting traffic flow during all phases of construction.

- D. Electrical/Mechanical Decommissioning: When the bascule operations are discontinued this project will selectively demolish existing electrical and mechanical systems associated with bascule operations. Existing equipment will be salvaged and repurposed to another commission bridge of similar design.

*Projected Timeline:* Design and Construction 2025-2026

*Projected range of Costs:* \$1,250,000 to \$1,500,000

*Projected Impacts:* If required single lane alternating traffic control will be used during all phases of construction.

See photos Appendix A pages 32 -33.

## 5. Ocean City-Longport Bridge (CR 656) 3100-001

This fixed span high level bridge opened to traffic in July 2002 and connects Ocean City to Egg Harbor Township in Atlantic County. The bridge is in satisfactory condition, however, to preserve this bridge capital improvements are recommended, such as fender replacements, deck patching, substructure and superstructure concrete repairs, and deck membrane sealing overlay. Traffic safety improvements will also be necessary such as lane striping and signage. There is no programmed replacement of this bridge within the next 15 years. In 2021 the southeast approach guiderail terminal was replaced.

The 2020 NBIS report rated the overall condition of the structure as “satisfactory” due to the superstructure and substructure conditions. The deck is in “satisfactory” condition due to the fine to medium transverse, longitudinal, and random cracks in the poured deck slab. The superstructure is in “satisfactory” condition due to many hairline and several fine cracks in the webs and bottom flanges of the pre-stressed girders and the concrete table girder. The substructure is in overall “satisfactory” condition due to the combination of missing wales on the fender system on all sides for the full length, and the remainder of the structure is in “satisfactory” condition due to numerous hairline and fine cracks in the pier caps and columns.

### Ocean City-Longport Bridge Improvement Plan

To maintain the Ocean City Longport Bridge, the Commission plans to perform the following improvements that are recommended in the NBIS Inspection reports.

- A. Fender Replacement: This project consists of replacement of the fender system due to deterioration and being combined with fender replacement projects at Corsons Inlet, Townsends Inlet, and Grassy Sound bridges. These defects are identified as a Priority 2 repair in the current and past NBIS reports.

*Projected Timeline:* Design 2023. Construction 2023-2024

*Projected range of Costs:* \$1,975,000 to \$2,375,000

*Projected Impacts:* Brief vehicular traffic interferences due to installation of pilings below bascule span. Marine vessel possible impacts due to contractor occupying channel during construction at periodic times. Channel width is 150 ft.

- B. Deck Sealer Rehabilitation: The bridge deck was cast with an early version of high-performance concrete (HPC) and has exhibited numerous temperature and shrinkage cracks, which are now permitting water to permeate into the deck. If not addressed, this water infiltration will lead to premature degradation of the deck. Complete deck sealer to address significant map cracking in deck surface, including new joint seals. This project will significantly increase the service life of the concrete deck which is now almost two decades old. A life cycle alternatives analysis will be conducted to determine the best method to seal the deck system.

*Projected Timeline:* Design 2023-2024, Construction 2024-2025

*Projected range of Costs:* \$1,700,000-\$4,700,000

*Projected Impacts:* The work will be performed using single lane alternating traffic permitting traffic flow during all phases of construction.

- C. Superstructure/Substructure Repairs (spalls, bearings, and deck): General concrete repairs to the superstructure, substructure, and underside of deck.

*Projected Timeline:* Design 2024, Construction 2024-2025

*Projected range of Costs:* \$925,000 to \$1,125,000

*Projected Impacts:* The work will be performed using single lane alternating traffic permitting traffic flow during all phases of construction.

See photos Appendix A page 34 and 35.



## PROJECTED COST ESTIMATES AND FUNDING

Funding to carry out the Comprehensive Bridge Replacement and Improvement Plan for County and Bridge Commission projects will be provided by the County from several sources in addition to the County's own direct investment. Outside funding sources, both grant and very low interest rate loans, include Federal Aid, State Aid, and the New Jersey Infrastructure Loan Financing (I-bank).

As part of its Statewide Capital Investment Strategy, the NJDOT is focusing on preventive maintenance, rehabilitation, and selective replacement of bridges. This program was initiated in recognition of funding needs that go well beyond what is currently available at the local level or through the Local Bridges Future Needs Program. The I-Bank is an independent State Financing Authority that is authorized to issue revenue bonds for the purpose of making loans to finance the construction of eligible major environmental and transportation infrastructure projects

As shown in the below Tables, the **total** projected cost for bridge replacement and improvement from 2020-2035 for both County and Commission Bridges ranges **between \$603 Million to \$890 Million**.

The estimated total costs are comprehensive and include conceptual design, public information sessions, engineering consulting fees, permit preparation and application fees, right-of-way acquisition, environmental mitigations, demolition of existing structures and construction costs. The County will be seeking to secure funding by outside agencies to cover at least seventy percent (70%) of project costs, however, the County has prepared a financial plan to cover up to fifty percent (50%) of project costs as a precautionary measure. It is important to note that any commitment of funding or bonding as well as the specific allocation of funds in support of this plan will be discussed and authorized on a case-by-case basis thru the action of a Commissioner Board Resolution. The life expectancy on all replacement projects is seventy-five (75) years.

As referenced earlier, fortunately, the County put the first element of its financing plan in place beginning in 2017 by annually dedicating a portion of its tax levy toward the bridge project. By continuing to do so and by carefully phasing design and construction over a 15-year period, the County can responsibly complete these very substantial and critical infrastructure replacements and improvements with modest and manageable effect on County taxpayers. For example, at just five-tenths of a penny annually on the County tax rate for fifteen years, the County can bond, over several years and phases, more than \$500 Million towards these projects if ultimately needed. To aid in context, this amounts to an annual increase of approximately \$12.50 for \$250,000 of assessed value to fully fund the County's share of the total projects at a county funding percentage of just over fifty percent (50%). This is certainly not overly burdensome given the magnitude of the projects, their critical nature, and the economic and quality of life benefits received by having such important infrastructure fully functional.

Finally, it's important to note that the County's very strong financial position and ability to initiate significant upfront costs for planning, engineering design, permitting, and construction without third party support is a powerful tool towards attracting and maximizing both State and Federal Funding for the projects contemplated. In this manner, the County demonstrates its seriousness about moving

projects forward to “shovel ready” condition, a status that “turns heads” and facilitates robust State and Federal partnership funding.

TABLE A: SUMMARY OF BRIDGE REPLACEMENT AND IMPROVEMENT PROJECTS including PROJECTED COST RANGE  
CAPE MAY COUNTY BRIDGES

BRIDGE	Project Estimate (lower limit)	Project Estimate (upper limit)	PROJECT	PROJECT START	PROJECT COMPLETION
1. 96th Street 0500-006	\$21,500,000	\$23,000,000	Bridge Replacement	2025	2026
2. Mill Creek 0500-030 and Upper Thorofare 0500-020	\$1,350,000	\$1,550,000	Phase 2 Scour and Spall Repair	2022	2022
	\$1,650,000	\$1,850,000	Phase 3 Pedestrian	2023	2024
3. Hand Avenue 0050-031 and Springers Mill	\$4,530,000	\$4,730,000	Bridge Replacement	2023	2023
4. 104th Street 0500-023	\$1,570,000	\$1,770,000	Bridge Replacement	2022	2023
5. 25th Street 0500-024	\$1,890,000	\$2,090,000	Abutment Replacement	2022	2023
6. 21st Street Bridge 0500-010	\$1,890,000	\$2,090,000	Abutment Replacement	2022	2023
7. Ludlams Thorofare 0500-005	\$12,350,000	\$13,400,000	Deck Rehabilitation	2025	2028
8. Cedar Swamp Bridge 0500-018	\$1,850,000	\$2,025,000	Guide Rail & Deck Repairs	2023	2025
	\$7,050,000	\$7,550,000	Bridge Replacement	2025	2031
9. Leonards 0500-009 and Gravens 0500-003	\$4,150,000	\$4,350,000	Deck Rehabilitation	2025	2027
10. Great Channel 0500-028	\$3,750,000	\$3,950,000	Bridge Rehabilitation	2022	2023
	\$71,900,000	\$161,900,00	Bridge replacement	2023	2038
<b>TOTAL COUNTY BRIDGE PROJECT COST</b>	<b>\$135,430,000</b>	<b>\$230,255,000</b>			

TABLE B: SUMMARY OF BRIDGE REPLACEMENT AND IMPROVEMENT PROJECTS including PROJECTED COST RANGE  
COMMISSION BRIDGES

BRIDGE	Project Estimate (lower limit)	Project Estimate (upper limit)	PROJECT	PROJECT START	PROJECT COMPLETION
<b>1. Ocean City - Longport 3100-001</b>	\$1,975,000	\$2,375,000	Fender Reconstruction	2023	2024
	\$1,700,000	\$4,700,000	Deck Sealer Rehabilitation (Latex or Other Overlay)	2023	2025
	\$925,000	\$1,125,000	Superstructure Repairs (spalls, bearings, deck)	2024	2025
<b>2. Corsons Inlet 3100-002</b>	\$2,400,000	\$2,900,000	Fender Reconstruction	2023	2025
	\$4,000,000	\$5,000,000	Trunnion Column Rehab & Span 32 Deck Rehab	2020	2025
	\$1,025,000	\$1,525,000	Superstructure Recoating	2023	2025
	\$1,250,000	\$1,500,000	Electrical/Mechanical Decommissioning	2025	2025
<b>3. Townsends Inlet 3100-003</b>	\$70,750,000	\$105,750,000	Bridge Replacement	2026	2035
	\$1,720,000	\$1,920,000	Fender Reconstruction	2023	2024
	\$2,400,000	\$2,800,000	Structural Steel Repairs-Approach Span Strengthening	2023	2025
	\$1,025,000	\$1,525,000	Superstructure Recoating	2022	2023
	\$280,000	\$380,000	Electrical Rehabilitation Projects	2022	2024
	\$65,750,000	\$167,750,000	Bridge Replacement – Concept Development & Construction	2023	2030

4. Grassy Sound 3100-005	\$1,850,000	\$2,250,000	Fender Reconstruction	2023	2025
	\$4,000,000	\$5,000,000	Structural Steel Repairs – Approach Span Strengthening	2020	2024
	\$1,025,000	\$1,525,000	Superstructure Recoating	2023	2025
	\$660,000	\$960,000	Slope Restoration/North Bin Abutment Scour Rehabilitation	2022	2024
	\$4,535,000	\$6,635,000	Bascule Span Rehab (incl. temp stringer repair)	2024	2025
	\$53,500,000	\$93,500,000	Bridge Replacement	2023	2038
5. Middle Thorofare 3100-006	\$1,170,000	\$1,470,000	Substructure Repairs (scour countermeasure S. Abutment & Pier 13)	2022	2024
	\$540,000	\$840,000	Electrical Rehabilitation – Auxiliary Motor, PLC Upgrade, Main Motor, Gates, Span Locks, generator.	2022	2024
	\$475,000	\$775,000	Superstructure Recoating	2023	2025
	(This project is part of the Ocean Drive Upgrades and Bridge Replacements and includes Mill Creek 0500-029 and Upper Thorofare 0500-030)	\$238,300,000	\$243,000,000	Bridge Replacements – (3) bridges + Culvert and approximately 2.7 miles (includes bridge lengths)	2020
TOTAL BRIDGE COMMISSION PROJECT COST	\$463,855,000	\$658,385,000	This overall cost includes the County’s Roadway and Bridge Replacements as part of Ocean Drive		

<b>TOTAL CAPE MAY COUNTY AND BRIDGE COMMISSION COSTS</b>	<b>\$605,716,000</b>	<b>\$893,715,000</b>	Upgrades and Bridge Replacements Project Noted Above
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APPENDIX A: PHOTOGRAPHS EXHIBITING  
COUNTY AND COMMISION BRIDGE AREAS  
OF CONERN 2022